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# From Artisans to “Factories”: The Interpenetration of Craft and Industry in English Cheese-Making, 1650-1950

Richard Blundel and Angela Tregear

This article traces the uneven development of English cheese-making, from its early commercialization to the eventual triumph of the “cheese factory.” The narrative shows how contemporary actors initiated and adapted to changes in technology, distribution, consumption, and regulation. It indicates that artisanal practices have both borrowed from, and become integrated with, industrial logics and strategies, exemplifying a process that Charles F. Sabel and Jonathan Zeitlin termed the “recombinability and interpenetration” of different forms of economic organization [*World of Possibilities: Flexibility and Mass Production in Western Industrialization* (Cambridge, 1997), 2-3]. International comparisons are introduced in order to clarify the reasons for England’s halting and idiosyncratic transition to industrial-scale cheese-making.

In the early twenty-first century, cheese-making in England is dominated by industrial scale operations, with just 2 percent being attributed to artisanal producers located on farms or in specialist dairies.<sup>1</sup> However, despite several early advances, the path to industrialization has been far from straightforward. During the seventeenth century, the English were amongst the first to specialize in commercialized forms of cheese-making and marketing. In the first half of the nineteenth century, English cheese-makers devised a standardized production system that became a template for industrial-scale manufacturing. However, while cheese factories multiplied in other countries from the mid-nineteenth century, production in England remained overwhelmingly farm-based and un-mechanized until the mid-1930s. In this article, we seek to explain this distinctive pattern of industrialization. We examine changes that took place as this production system diverged from an ideal-typical artisanal form, and highlight how it intermingled with an emerging proto-industrial model.

The significance of cheese-making as an economic activity derives from its capacity to harness a biological mechanism (i.e. fermentation) to convert a highly-perishable raw material into a food product that can be more readily transported and stored. We suggest that the halting and idiosyncratic industrialization of English cheese-making exemplifies a process that Charles F. Sabel and Jonathan Zeitlin have termed the “recombinability and interpenetration” of successive forms of economic organization. In our account, England’s distinctive pattern of development can be explained by counterposing the growth of new forms of knowledge, based around efforts to standardize this economic activity, and the persistence of earlier artisanal forms. The narrative suggests a degree of tension between the efforts of those who sought to control the variability inherent in natural processes, and an alternative perception of productive opportunity, based on exploiting the characteristic variety that such processes engender. Furthermore, in reconstructing the agency of different strategic actors, as they negotiate technological innovations and competitive pressures in pursuit of differential advantage, our study contributes to the broader debate over evolutionary analogizing.<sup>2</sup>

To gain a better understanding of the underlying logics and the strategies of the actors involved in these developments, we need to combine discrete historical episodes into what Francesca Carnevali has described as a “complex tapestry” of interpenetration processes, stretching back over several centuries.<sup>3</sup> With its extended temporal scope, the narrative allows us examine the relationship between social structures established in eighteenth-century England, instances of entrepreneurial agency arising within these structures, and specific outcomes in terms of the country’s distinctive patterns of production and consumption.<sup>4</sup> The recurrent interplay between production and consumption is a common thread running through this tapestry, echoing Edith Penrose’s seminal examination of broadly similar, though shorter-run, interaction effects in the history of a single firm.<sup>5</sup> Transposed to a national level, these effects are reflected in enduring cultural preferences, including appetites for particular cheese varieties, as well as in the changing fortunes of the country’s artisanal and industrial production systems.<sup>6</sup> Looking beyond the national context, we consider the impact of pre-existing trading relationships and knowledge transfers upon domestic production and consumption. We also contrast the English case with that of two other European countries, the Netherlands and France, in order to provide a comparative frame. The Dutch and the English experienced a broadly similar pattern of early commercialization, with volume production becoming concentrated on specialized farms within their main dairying regions. However, while the English experiment with cheese factories faltered, commercial cheese-making in the Netherlands was more readily translated onto an industrial scale during the second half of the nineteenth century, displacing much of the country’s farm-based production. French cheese-making presents another contrast, retaining a relatively pure artisanal character into the mid-nineteenth century, with little in the way of commercialization or regional specialization. French agricultural and food policies were far more supportive of small-scale, territorially differentiated cheese production, compared to those of England. However, the French also proved more adept at exploiting the early potential of the cheese factory to launch a number of “national” cheese varieties in the late nineteenth century. French artisanal production benefited

from regulatory protection during much of the twentieth century, but was challenged by the major modernization programs that followed the Second World War.

The article is divided into three broadly chronological sections: "commercialization and regional specialization (c1650 to 1850s)"; "from the farm to the factory (1850s to 1930s)"; and "regulation and concentration (1930s to 1950s)," followed by a set of conclusions. The section headings are intended to reflect Sabel and Zeitlin's approach to historiography, indicating a sequence of interpenetrating economic orientations rather than tightly-delineated periods.<sup>7</sup> At the end of each section, there is a short summary and an international comparison.

### Commercialization and Regional Specialization (c1650 to 1850s)

In the mid seventeenth century English cheese-making was distinctly artisanal in character, the norm being small-scale production on the farm, with very low levels of mechanization. Cheese was still produced primarily for subsistence purposes on the farm or for consumption in the immediate locality. However, from early in this period there were changes in cheese production patterns as farmers in the most favored dairying regions, which included the Cheshire Plain, Somerset, and North Wiltshire, began to commercialize their activities.<sup>8</sup> Despite retaining many artisanal characteristics, cheese-making in these regions became an increasingly specialized activity, with dairy farmers adopting new production and marketing practices in order to secure and to enhance their incomes. Meanwhile, traditional practices persisted in more remote areas, such as the Northeast, and also on the margins of "commercial" dairying counties, such as Suffolk.<sup>9</sup> Commercialization and regional specialization were influenced by a combination of factors. First, over the previous century or so, the more progressive dairy farmers had augmented the natural advantages of their relatively flat, well-watered, and well-drained lowland pastures through various forms of agricultural "improvement."<sup>10</sup> As a result, by the mid seventeenth century, many of these farmers were generating healthy milk surpluses. These improvement efforts coincided with developments in England's transportation systems, opening up new opportunities to market their produce. More reliable coastal navigation, coupled with an expanding canal network, created new distribution channels for agricultural commodities, offering farmers and merchants the opportunity to build new regional and national markets for their products. However, before the advent of the steam railway, it remained impractical to transport liquid milk over any significant distance. As a consequence, farmers in the prime dairying regions turned their attention to less perishable products, notably butter and cheese, in order to valorise the surplus.

A further stimulus to commercialization was the structure of the market for dairy goods in this period. London was the first and most important commercial market for both butter and cheese. By the late seventeenth century, the trade between Cheshire and the capital was dominated by only nine cheesemongers, an indication of the increasing concentration taking place during this period.<sup>11</sup> The cheesemongers often developed close relationships with sea captains that, by the eighteenth century, included the joint ownership of merchant ships.<sup>12</sup> However, their success in creating these large and complex supply networks market was accompanied by accusations of unfair pressure being applied to farmers.<sup>13</sup> The cases of Suffolk and Cheshire cheese illustrate the

challenges faced by the commercial cheese-makers in this period, the strategies adopted to deal with these issues, and their combined impact on production and consumption.

The county of Suffolk had a reputation for high-yielding dairy herds, and since the sixteenth century much of the capital's cheese and butter was supplied via a relatively short coastal passage from ports such as Yarmouth, Woodbridge, and Ipswich.<sup>14</sup> However, the quality of cheese declined as dairy farmers pursued the commercial logic of this combined trade.<sup>15</sup> Cream from Suffolk milk was required for butter-making, farm cheese dairies had to make do with the remaining, heavily skimmed milk. The county developed a reputation for producing an inferior "flet" (i.e. skimmed) milk cheese, its legendary hardness being signified in the colloquial name, "Suffolk Bang"; Samuel Pepys recalled finding his wife, "vexed at her people for grumbling to eate Suffolk cheese—which I am also vexed at."<sup>16</sup> For their part, the Suffolk cheese-makers had a clear idea about who was to blame for this predicament—cheesemongers and their abuse of recent legislation to control the weight and packaging of dairy products. In 1690, they petitioned Parliament to defend their livelihoods against this perceived harm:

[T]he Cheesemongers in London have of late Years encouraged the Farmers to make Flett Cheese, whereby the Quantity of Butter sold with such Cheese is increased to Four Firkins in a Load; but the Cheese thereby becomes only fit for Slaves; from whence the Commodity is grown into Disrepute, and, if not prevented, will become a general Prejudice.<sup>17</sup>

However, by this stage, the London market was already opening up to commercial cheese-makers from farther afield. The opportunity arose in the late 1640s, when cheese production in Suffolk was affected by a combination of cattle disease and flooding, which prompted shortages in the capital and a substantial rise in wholesale prices. It was at this point that dairy farmers on the Cheshire Plain and in adjacent counties began to supply large quantities of cheese to the capital, primarily on the coastal route from Chester and Liverpool. Despite their relatively wide geographic spread, these products were generally traded under the generic title, "Cheshire" cheese. The sea-borne trade grew substantially during the seventeenth and eighteenth centuries; William Maitland estimated that 5,860 tons of Cheshire cheese was being shipped to London in 1729, suggesting that the market had more than doubled since the 1680s.<sup>18</sup>

Cheese-makers in the Cheshire Plain adapted their production practices in order to meet the new commercial realities of the London market.<sup>19</sup> For example, farm inventories from the mid-seventeenth century indicate that new specialist producers in Cheshire were building up large stocks of cheese, in contrast to their more traditional counterparts. Farmers also developed collaborative arrangements for producing "Greate" (i.e. large) cheeses that were destined for London, and subsequently for the cities of the Northwest.<sup>20</sup> Milk from several farms was pooled, and the task of cheese-making being taken on by farmers with specialized cheese dairies. In 1698, these innovative practices attracted the attention of the diarist Celia Fiennes:

[T]ho' this shire [county] is remarkable for a greate deale of greate Cheeses and Dairys, I did not see more than 20 or 30 cowes in a troope feeding, but on enquiry find the Custome of the country to joyn their

milking together of a whole village and so make their greate Cheeses and so it goes round.<sup>21</sup>

Not only did the Cheshire cheese-makers extend such practices, some specialist farms opened up to further development, as freeholders, enterprising tenants, and independent investors became involved.<sup>22</sup> For some, it proved a very profitable activity; the more successful cheese-making farms increased their acreages, and dispersed land holdings were reorganized in more efficient ways. In the Cheshire case, it seems likely that new enclosures between the mid-seventeenth and mid-eighteenth centuries, and a reduction in the numbers of small farms is related to these changes in the nature of the markets and associated technologies.<sup>23</sup>

The Suffolk and Cheshire cases indicate how some of the commercial cheese-makers in this period acted entrepreneurially to deal with the challenges posed by the new market structures. The production practices of these leading commercial regions also served as models for specialists seeking to promote a more general spirit of improvement in English cheese-making. Dairy farmers in the Cheshire Plain were in the vanguard, with those located in other English dairying regions following some way behind. The cheese-makers of Somerset, for example had a long-established reputation amongst elite consumers for their Cheddar variety, yet until the mid-eighteenth century supply remained very limited, with only a few districts in the east of the county reaching far beyond their immediate locality.<sup>24</sup> Dairy farmers of sufficient financial and social standing also engaged in collaboration with the London cheesemongers, becoming their “cheese factors,” responsible for purchasing cheese and arranging for its delivery to ports.<sup>25</sup>

Another form of entrepreneurial agency by commercial cheese-makers was the creation of distinct identities for their products, with the conscious aim of exploiting new market opportunities. The case of Stilton illustrates this well. Though shrouded in its own creation myth, the origins of this variety display some characteristic features of commercialization, including strategic location—the village of Stilton in Leicestershire was a stopping point on the main overland route between London and the North—and the intervention of an entrepreneurial figure who contributed to its development as a premium variety.<sup>26</sup> Though local production practices remained essentially artisanal in character, the composition of the product was standardized to some degree, and its reputation was actively developed by in an effort to meet the demands of this new market segment. By the mid-nineteenth century, demand for Stilton was being satisfied by cheese-makers from adjacent counties, including Rutland, Lincolnshire and Nottinghamshire. However, in contrast to Cheddar, the variety retained its geographic specificity.<sup>27</sup>

Turning to consumption trends in this period, the most visible outcome of commercialization and regional specialization was that the English were becoming accustomed to a limited range of cheeses that were often distributed over a considerable distance. The tendency towards concentration is suggested in an 1816 account of the “principal sorts of cheese made in Great Britain,” which identifies just eight English pressed territorial cheeses.<sup>28</sup> However, the market was still dominated by home-produced cheese; imported cheese would remain a relatively minor part of the trade until the mid-nineteenth century, with Dutch and Irish pressed cheeses being the only imported

products enjoying a significant presence. Even in the case of the Netherlands, the competitive threat seems to have been more apparent than real. For example, though Cheshire and Lancashire cheese producers were apprehensive about the threat of Dutch imports as a consequence of the fall in prices after the Napoleonic wars, there is little evidence that this threat ever materialized.<sup>29</sup>

### *Summary and International Comparison*

The early commercialization of English cheese-making established many characteristics of a modern industrial market system. These included: much greater regional specialization in the production of cheese, with corresponding increases in the volumes of cheese manufactured in principal dairying regions such as Cheshire, and in the average distances that products travelled in order to reach the end consumer; the introduction of intermediaries—cheese factors and cheesemongers—specializing in the purchase, transportation, and wholesaling of large volumes of cheese; modifications to products and production practices in order to satisfy the requirements of cheese factors and consumers; the introduction of regulatory regimes to protect commercial interests; and changes in consumption patterns, as the country's urbanized population became increasingly accustomed to the principal varieties. However, notwithstanding the changes in distribution and consumption, and the ways in which some aspects of production was adapted to the new market environment, the underlying techniques of cheese-making remained resolutely artisanal. Even on the commercial cheese-making farms, there was still a considerable reliance on traditional working practices, localized knowledge and manual labor. The cheese dairy continued to be closely integrated with other farm enterprises, notably pig-rearing; meanwhile, dairy farmers in remote and upland areas were still heavily dependent on local customers and markets.<sup>30</sup>

Overall, many similarities can be identified between English and Dutch cheese-making in this period. In both countries, moves towards standardization were made in parallel with concentration in downstream supply chains. In the Netherlands, the location of dairying regions such as Gouda, close to the established trading centres of Amsterdam, Rotterdam, and the Hague, led farmers to specialize in the production of capital intensive, non-perishable products like cheese from the late medieval period. Geographic proximity and a large merchant navy fleet have also been identified as important factors supporting the development of a thriving export trade with countries such as England.<sup>31</sup> Though England had become a less important market by the early nineteenth century, Dutch products clearly remained popular and well-adapted to English tastes. In his review of foreign cheeses, Josiah Twamley praised its, "sharp saline taste," observing that, "Dutch cheese is prepared in the manner generally adopted in Cheshire [...] the Gouda cheese is particularly celebrated."<sup>32</sup> French cheese-making in this period provides a marked contrast with the commercialized structures that had been established in England and the Netherlands. Polycultural farming systems and localized supply chains were the norm and production practices were still largely determined by location-specific factors, such as the seasonal transhumance of mountain areas. Although examples of more specialized dairying activity can be identified in some regions, such as Normandy and Rouergue in the Southwest, these may be considered exceptions to the general pattern.<sup>33</sup>

## From the Farm to the Factory (1850s to 1930s)

As they approached the 1850s, English cheese-makers appeared to be on the brink of a transition to full-scale industrial development. The early commercialization of the country's agricultural and food manufacturing sectors had provided the essential infrastructure, while its increasingly urbanized mass markets created a growing demand for industrial products. Furthermore, by the mid-nineteenth century, many of the commercial English cheese-makers were engaged in scientific experimentation, their aim being to deliver increased consistency to satisfy the needs of the wholesalers and retailers. Although each of the main English regional varieties was subject to experimentation, Cheddar was the focus of attention. This can be attributed to a combination of the intrinsic characteristics of the cheese, its increasing economic significance—Cheddar was now overtaking Cheshire as the leading commercial variety on the London market—and the pioneering efforts of several leading Somerset cheese-makers. The most prominent of these was Joseph Harding (1805-1876), a successful dairy farmer. Harding and his contemporaries conducted many experiments involving the precise and systematic control and monitoring of key variables such as temperature and acidity. They also recognized that process innovation must be matched by investments in human capital, promoting the establishment of educational programs for cheese-makers and dairy maids, and calling for improvements in the physical condition of farm dairies in order to tackle quality problems. Their work can be seen as a more rigorous extension of the efforts of earlier practitioners, such as Twamley, but distinguished by their more systematic application of natural science principles. The results of these experiments were published in specialist agricultural and dairy journals, in a free flow of information reflecting the spirit of scientific inquiry. This cycle of experiment and publication contributed to the formalizing of cheese-making practices into distinctive “systems,” in effect, sets of standardized instructions or “recipes” for the more efficient production of specific English regional varieties. For example, systems based on Harding's principles were being adopted during this period on farms in Somerset, Wiltshire, Gloucestershire, Ayrshire, and Galloway, with modifications being introduced to cheese-making practices in Cheshire, Lancashire, and some Midland counties.<sup>34</sup> The efforts of Joseph Harding and others to improve English cheese-making were motivated, to some degree, by an awareness that cheese-makers faced a potential threat from imported products. However, the nature of the knowledge being developed, and the enthusiasm with which it was disseminated, ultimately had the paradoxical effect of intensifying the competitive threat. Once formalized, the production practices of Harding's Cheddar system were readily reproducible in other locations. Furthermore, the process of imitation was actively encouraged by the evangelizing efforts of several leading figures in English cheese-making. Harding's own family illustrate this phenomenon, notably in the case of Henry Harding, a son who was instrumental in exporting the Cheddar system to Australia.

As experiments continued on England's commercial cheesemaking farms, developments in North America were about to provide a springboard for industrial scale



production. As in England, one of the primary aims was to produce a more uniform cheese for the volume market. The first cheese factory was constructed in Oneida County, New York State, in 1851, but the innovation did not catch on immediately. Furthermore, though the term “factory” was used from the outset, production processes were essentially unchanged from those used on the farm, the main differences being that the building was purpose-built in order to produce on a larger scale, cheese-making equipment was larger, and milk supplies were drawn from several contributing farms.<sup>35</sup> The American Civil War (1861-1865) triggered a surge in factory-building and an equally dramatic increase in the export trade. The war removed men and women from the dairy farms, blocked lucrative Southern markets, and contributed to a doubling of market prices, as English importers paid for cheese in gold, which was converted into inflated paper money.<sup>36</sup> In 1864, it is estimated that 205 factories were responsible for about a third of the cheese produced in New York State; by 1870 there were over 900 factories, and by 1875 one observer estimated that over 90 percent of the state’s cheese was factory-made. Exports to the United Kingdom increased tenfold, from around 5 million pounds (2,300 tons) in 1859 to more than 50 million pounds (22,700 tons) in 1863.<sup>37</sup> They continued to increase over the following decade, doubling in volume by 1874. By this time, factory cheese from the United States represented more than half of total imports (see table 1) and, based on contemporary estimates, more than a quarter of the English market.<sup>38</sup>

Table 1 here

Given this context, it is perhaps unsurprising that visitors to the Harding family cheese dairy included Xerxes A. Willard, a representative of the American Dairyman’s Association, who toured England in the Summer of 1866. For Willard, a strong proponent of cheese factories, Harding’s Cheddar system was one of the few redeeming features of English cheese-making:

In cheese-making their appliances are inferior, their work more laborious and they have but really one style of cheese that competes with the best grades in our factory make. [i.e. the highest quality cheese produced in our factories] This is the cheddar. In the cheddar process ...there are doubtless suggestions which will be adopted in our practice when their superiority is demonstrated.<sup>39</sup>

Willard noted appreciatively that in Harding’s Cheddar system, “He has simplified the process of manufacture and helped to reduce it more to a science,” following his remark with appreciative comments on the standards of cleanliness. He also conceded, apparently from the perspective of 1877 when his book was first published, that American factories had, “not yet been able to surpass in excellence the fine specimens of English cheddar. It is a very high standard of cheese, and is deserving of all the encomiums which it has received from time to time.”<sup>40</sup>

Though modest quantities of American Cheddar had been sold in England shortly before the emergence of the first factories, Willard’s visit marked a turning point for cheese-making in both countries. On his return to the United States, Willard set about

promoting the essential principles of Harding's Cheddar system at dairy conventions, on factory visits, and in technical papers. These ideas were duly applied and further developed by managers of the new generation of cheese factories, in conjunction with innovative mass-production technologies, such as the steam boiler and the "gang-press" (see figure 1).<sup>41</sup> In addition to the potential scale economies associated with the factory system, the American factories benefited from access to extensive, high quality grazing land and large, productive dairy herds, while also being unencumbered by established production practices and local market preferences.<sup>42</sup> Having also secured a standardized and well-proven recipe for one of England's most popular cheeses, they had the necessary pre-requisites to exploit the new productive opportunities across the Atlantic.

Figure 1 here

In England meanwhile, the response of cheese-makers to this step change in international competition was surprisingly muted. English cheese-makers did not embark on the kind of intensive factory-building programs seen in the United States. It was not that the dairy sector was unaware of its new rival. In 1868, a Wiltshire newspaper published the following critique, voiced by a visiting American cheese-maker:

[I]t is a matter of surprise that the people of the district are so bound up in the old practices as to waste their time and substance in manufacturing cheese of this character. Comparing the Wiltshire method and the apparatus in use with our factory system, the latter is about a century in advance.<sup>43</sup>

In the same year, the Royal Agricultural Society in England launched an investigation into the American factories. The chief instigator of the enquiry, Lord Vernon, then persuaded the Derbyshire Agricultural Society to introduce the factory system, albeit on a limited scale; England's first cheese factory opened in Derbyshire in 1870. By this time, the factory-building boom in the United States had been underway for several years, and it is perhaps unsurprising that the English sought out experienced managers from New York State to share their technical expertise.<sup>44</sup> Others factories followed, so that by 1889 sixteen could be seen on the railway between Derby and Ashbourne.<sup>45</sup> However, though similar initiatives were launched in several dairying regions, the factory movement faltered, and with a few exceptions, failed to thrive. In Wiltshire, for example, the first factory opened in 1875, making Cheddar under the Harding system. It struggled with cheese-making for several years, then changed to butter-making. Another factory opened in 1895, using milk brought in by local farmers to make "Canadian" type Cheddar. This proved unprofitable and was replaced by butter-making in 1902.<sup>46</sup> Furthermore, where industrial-scale cheese-making was established, the factories tended to operate as temporary sinks for seasonal surpluses, rather than as dedicated bases for continuous production. As adjuncts to the liquid milk trade, they were therefore quite different in nature to the export-led cheese factories established in the United States, Canada, Australia, and New Zealand.<sup>47</sup>

One of the most powerful, and certainly the most visible, explanation for the country's failure to meet the challenge of the American factories was the growth of

England's railway network. With fast and reliable rail transportation, retail dairies in the main urban centers were now able to meet the growing demand for fresh milk by securing daily deliveries from the surrounding countryside. The initial impact of "railway milk" was felt in the cheese-making regions of Lancashire and Cheshire, which now fell within easy reach of the rapidly-expanding industrial cities of the Northwest.<sup>48</sup> Dairy farmers located close to a rail terminal had an opportunity to dispose of their cheese presses, in favor of a reduced workload and a more regular income in the new milk trade.<sup>49</sup> The spatial distribution of cheese-making altered accordingly, with the virtual disappearance of producers in some well-known commercial regions, being partly offset by increases in production in less accessible dairying regions. For example, while cheese production in Swaledale recovered between 1860 and 1914, Cheshire cheese-making migrated southwards into rural Shropshire in the same period.<sup>50</sup> However, the net result was a long decline in domestic cheese production, as the overall balance shifted toward liquid milk. Between the 1860s and 1914, national butter and cheese production declined by 40 percent while liquid milk production quadrupled.<sup>51</sup> London's railway milk trade was a later development, which greatly accelerated this transition. With an extensive railway infrastructure already in place, London was able to make a rapid transition to railway milk, with immediate implications for cheese-makers in surrounding regions. For example, by the late 1860s, farmers in Wiltshire, Berkshire, and Oxfordshire were abandoning cheese-making in order to supply the London milk market.<sup>52</sup> However, dairy farmers in other cheese-making regions were less willing to abandon their cheese-making traditions. For example, the railway line into Wensleydale was opened in 1878, yet the trade in fresh milk was largely non-existent prior to the 1890s, at which point only limited exports are recorded. Christine Hallas concludes that for dairy farmers, the decision to switch to exporting liquid milk was effectively forced by rapid falls in cheese and butter prices during the 1890s; it was not an opportunity that they had identified from the outset.<sup>53</sup>

Loyalty to farm-based cheese-making provides a further explanation for the failure of the English cheese factories. However, it would be a mistake to represent attitudes of this period as outright conservatism. Correspondence in the agricultural journals indicates that there were heated arguments over the respective merits of farm and factory systems. For example, in 1868 a Wiltshire skeptic was arguing that the "home system" of cheese-making secured the highest market prices, while the American factory system would always be, "a long way behind in quality."<sup>54</sup> This was a material issue for farmers. As increasing quantities of imported cheese became available, the prices of some local varieties were beginning fall, albeit with considerable short-term variations.<sup>55</sup> By the late 1880s, dairy farmers had greater direct or indirect experience of the factory concept, and there are indications of a wider range of views being taken. However, negative attitudes toward the factory system persisted well into the twentieth century. For example, as late as 1929, a contributor to a popular text on cheese-making was still expressing confidence about the market position of "the best" farm cheese:

For a short time the price of home-made cheeses was affected by imports from the other side of the Atlantic, but people soon learnt to appreciate the difference between the "filled" [i.e. imitation] and the home-made article,

since when the best English and Scottish cheese has never been in jeopardy.<sup>56</sup>

Though niche markets for premium products did indeed remain strong, large quantities of farm cheese was of variable or inferior quality, and consequently was unable to compete with an increasingly consistent imported product. The quest for greater consistency is reflected in the major initiatives of the period. Around the turn of the century, there were efforts to improve the prospects of farm-based cheese-making. Agricultural societies and local councils helped to set up dairy education courses, including itinerant schools that visited local farms, in part with the aim of preserving traditional rural skills.<sup>57</sup> Another approach was adopted in the late 1920s, when the English Cheddar Cheese Federation, and its Cheshire counterpart introduced voluntary grading schemes, similar to those previously established in exporting countries such as New Zealand, whereby farm cheese was assessed by independent inspectors. These schemes were coupled with promotional campaigns for “farmhouse” cheese (see figure 2).

Figure 2 here

The competitive threat intensified in the 1880s, when cheese-makers in other countries began to challenge the United States’ dominance of the English market. The English cheese factors expanded their purchasing operations accordingly, in order to accommodate the new sources of supply. For example, by the end of the decade, the English cheese factor Samuel Budgett & Son had offices in Bristol, London, Liverpool, New York, and Montreal, and could boast that its U.K. branches and representatives sold dairy produce, “from all parts of the globe.”<sup>58</sup> Writing in 1889, English factors noted that the New Zealand cheese had, “considerably interfered with the sale of American and Canadian [cheese],” having been “constantly sold as American,” in previous years. However, they could afford to remain philosophical in the face of these international shifts in production. As one of the factors noted, “time alone will show” whether New Zealand’s challenge would last, but in any event, “the trade are not confined to any particular make, but look out for the best value.”<sup>59</sup> The cheese factors took a stronger line on modes of production, one stating, “without hesitation,” that the factory system is best, given a sufficient supply of milk.<sup>60</sup> By contrast, English dairying specialists continued to promote the case for farm-based production. For example, Professor James Long of the Royal Agricultural College journeyed to New Zealand at the request of the government, to show how cheese might be, “more economically made, more perfectly shipped, and more profitably sold” [in England].<sup>61</sup> Though widely-travelled, with direct experience of factory production in North America, Long remained a strong proponent of farm-based cheese-making “upon modern lines,” insisting that, “better cheese is made on the farm than in the factory” and marshalling evidence to this effect. The New Zealanders were unconvinced by the arguments.<sup>62</sup> Four years after Long’s report was published, the New Zealand’s Chief Dairy Instructor stated that the industry’s future success depended on a rapid expansion of the factory system, “and by the enactment of competent legislation to protect such institutions once established.”<sup>63</sup> (See figure 3.) New Zealand’s export trade with the Britain grew rapidly in the following decades, rising

from 4,300 tons in 1901 to more than 90,200 tons in 1928, the latter being almost entirely factory-made.<sup>64</sup>

Figure 3 here

By the 1920s, and after more than five decades' experience, English consumers were fully accustomed to imported factory-produced cheese. As a relatively cheap, and increasingly uniform product, the New Zealand and Canadian Cheddars matched the requirements of the new multiple food retailers, such as Liptons and Maypole Dairies, whose business models were based on consistently-packaged and branded mass-market products. From time to time, elite consumers expressed their concern at the loss of traditional varieties, their protests serving to underline the scale of the changes that had occurred:

[I]t was possible a century ago to travel throughout England and sample local cheeses everywhere. Today most of them are unobtainable unless in small quantities from eclectic merchants. Even in first-class chop houses [i.e. restaurants] the only English cheeses on offer will be Stilton, Cheddar or Cheshire; in most places only Cheddar and Cheshire [...] and such a notable cheese as Double Gloucester is known to few but epicures.<sup>65</sup>

The continuing influx of cheap imported factory cheese contributed to a long downward trend in market prices, interspersed by precipitous short-term falls. The efforts of farmers to secure an income also led to a periodic destabilization of the liquid milk market due to over-supply.<sup>66</sup> By the mid-1920s, the English dairying sector was close to collapse. The market for cheese was dominated by imported factory products, prompting vociferous but ineffectual complaints from gastronomes—Sir John Squire, for example, dismissed the imports as, "mere generic soapy, tasteless stuff [...]."<sup>67</sup> New Zealand and Canada were now the main sources, accounting for more than 80 percent of the total (see table 2). Domestic production had declined from an average of 46,500 tons in the years 1909-1913 to just 34,000 tons in 1924, a figure that represented about 5 percent of the country's milk supply.<sup>68</sup> This meant that less than a quarter of the cheese available for consumption in England was home-produced. In contrast to its imported rivals, English cheese was still predominantly produced on the farm. Farms accounted for 75 percent of output, with only 18 percent coming from specialist cheese factories and the balance from milk distributors.<sup>69</sup> However, domestic production was limited to a few "principal" regional varieties: Cheddar (accounting for 52 percent of the total), Cheshire (30 percent), Lancashire (14 percent), Wensleydale (2 percent), Caerphilly (0.8 percent) and Stilton (0.4 percent).<sup>70</sup> Furthermore, the number of producers was continuing to fall, so that by the early 1930s, there were just 1,324 farmhouse makers registered.

Table 2 here

### *Summary and International Comparison*

This period began in a spirit of improvement and modernization, as England's leading commercial dairy farmers and cheese-makers began to apply scientific principles to cheese-making operations. However, it ended with what one commentator described as a "dismal" story of unsuccessful factory initiatives, and a continuing, but much-depleted pattern of farm-based, artisanal production. The English experiments did indeed contribute decisively to the early factory system, but it was to emerge across elsewhere, initially in North America. Managers of the early American factories reproduced and elaborated on Harding's Cheddar system with the aid of innovations in manufacturing and logistics technologies, and in work organization. In addition, they were able to take advantage of English supply chains that were already structured to distribute mass-produced products to an expanding urban population. The managers of the new factories formed strong trading relationships with English factors, whose primary concern was to obtain cheese in large and consistent volumes, at the lowest possible wholesale price. The late nineteenth century saw an intensification of international competition to supply the English cheese market, a process exemplified by the gradual displacement of factory Cheddar from the United States by cheese manufactured in Canada, Australia, and New Zealand. In England, the nascent factory system faltered, and proved incapable of matching its international rivals, while acting as an adjunct to the market for "railway milk." Many farm-based cheese-makers also found it impossible to compete in an increasingly hostile trading environment, and were effectively "pushed" into the liquid market. By the end of the period, there was still a division between the more progressive artisanal cheese-making concentrated in the former commercial regions, and a much more variable standard of production from farms that lay beyond the reach of the "railway milk" market. Amongst the former group, a small sub-category of artisans pursued what might be described as "positioning" strategies to supply premium niche markets. The economic position of these cheese-makers was reinforced by their established connections with specialist wholesalers, retailers, and restaurants, a pattern that would be repeated later in the century.<sup>71</sup> However, for the bulk of English cheese-makers selling into the mass market, there were severe commercial pressures. How could this dispersed and idiosyncratic mixture of farm-based and factory cheese-makers achieve the uniformity demanded by the cheese factors, and how could they differentiate their products from what was often, notwithstanding the comments of gastronomes, a superior quality imported factory cheese?

A comparison with the Netherlands and France reveals some areas of commonality, but more areas of contrast to England in this period. In the Netherlands, government-supported improvements in dairy production and processing meant that by 1910, factory cheese production (42,100 tons) had overtaken farm-based cheese-making (41,800 tons); the industry was also strongly oriented towards supplying export markets. For example, in Friesland, where more than two-thirds of all factory cheese was produced, Cheshire and Cheddar types were manufactured specifically for export to England.<sup>72</sup> In France, factory production of cheese also began in the specialized dairying regions in the late nineteenth century. By this time, large quantities of Camembert, for example, were being factory produced both in the product's home region in Normandy and in eastern France to supply the Parisian markets.<sup>73</sup> In contrast to England however,

the response of many French artisan cheese-makers to growing industrial production within and outside their areas tended to be spirited and vociferous resistance, on the basis that cheaper, factory produced versions, labelled under the same name, represented usurpation of their quality reputation and intellectual property. Artisans readily formed syndicates and associations to strengthen their interests and improve their lobbying power for better protection. Whilst England provided the initial impetus for an industrialized form of its leading cheese variety, readily replicated by other countries, and actively encouraged the resulting growth in low cost imports, France initiated a regime of *appellation d'origine contrôlée* (AOC) laws to protect the names of “special character” agricultural products from “fraudulent” use by industrial or external producers. Roquefort was the first cheese to benefit from the AOC laws, being awarded the designation in 1925.<sup>74</sup>

### Regulation and Concentration (1930s to 1950s)

From the mid-1930s, English cheese-making was re-defined by two key episodes of state intervention, the establishment of a Milk Marketing Board for England and Wales (MMB), and the imposition of direct control over the milk supply during the Second World War. The most visible result of this intervention would be a decisive shift in production, from farm to factory, the introduction of a strictly-controlled and monitored supply chain, and the virtual disappearance of artisanal cheese-making. By the inter-war period, the U.K. government had become increasingly concerned about the poor performance of domestic cheese producers, an issue that had been reinforced by food security concerns raised in the course of the First World War.<sup>75</sup> The parlous state of the domestic cheese-making sector was attributed, in large part, to the high and variable cost of the primary ingredient, raw milk, in relation to the low prices that could be obtained for cheese.<sup>76</sup> The government therefore sought a way to intervene in stabilizing milk prices but without harming trading relations with ex-colonies and potential allies at this politically sensitive time.<sup>77</sup> Following an extensive program of research, the MMB was established in 1933 as a statutory agency for the purchase and sale of milk and dairy products.<sup>78</sup> Its original purpose was to regulate the flow of milk into manufacturing and liquid markets, with farmers being paid a “pool price” for their milk, irrespective of its end use. By setting separate prices for milk that was subsequently sold into the liquid and manufacturing markets, the MMB was able to reduce the destabilizing impact of cheap foreign imported dairy products. The MMB also introduced state intervention in the form of quality control. The “National Mark” cheese grading scheme, superseded the voluntary schemes introduced by the Cheshire and English Cheddar Cheese Federations, and required the independent assessment of both farm and factory cheese against pre-defined criteria.

By 1940, with the country at war, officials at the Ministry of Food anticipated that stronger statutory powers would be needed to regulate the movement and utilization of milk. With imports of both dairy and meat products severely restricted, cheese was identified as a strategically important food, and all aspects of domestic manufacturing and distribution became subject to detailed regulation. In July 1940, the “National Mark” scheme was replaced with a compulsory grading scheme, which identified six “designated” hard pressed regional varieties. The manufacture of “non-essential” dairy

products, such as cream, had been prohibited and large quantities of milk were re-directed into cheese-making. Dairying specialists advised that production should be concentrated in the large industrial plants, now known by the generic title, “creameries,” in order to achieve the most efficient production with minimum wastage. Storage facilities were also requisitioned to ensure controlled periods of ripening under standardized conditions, and the industrial workforce was increased accordingly.<sup>79</sup> Farmers engaged in cheese-making were required to supply their milk to these plants, bringing all remaining on-farm production to an abrupt halt.<sup>80</sup>

Wartime controls of farm-based cheese-making were finally lifted in the early 1950s, prompting a small revival, with some new entrants. With the return of peace-time conditions, some of the more interventionist policies were relaxed. However, much of the regulatory infrastructure was retained. The national Milk Marketing Scheme would remain in place for another thirty years, with liberalization taking place in two stages, in 1981 and 1994. In the case of cheese grading, the compulsory scheme was replaced by a new set of schemes for both factory and farm-based cheese. In the case of the latter, although technically “voluntary,” in practice it exerted strict controls on cheese that could be produced on-farm, requiring it to be graded by officers appointed by the Board, and permitting only five varieties: Cheddar, Cheshire, Derby, Lancashire, or Leicester.<sup>81</sup>

The most tangible result of government regulation, under the MMB and in the more extreme conditions of the Second World War, was to preside over a radical shift in domestic production from the farm to the modern industrial-scale creamery. In the late 1920s, just 18 percent of domestic cheese production was factory-produced. By the late 1950s, the figure had increased to around 95 percent.<sup>82</sup> The number of farmhouse cheese-makers in the main dairying regions had declined significantly in this period, with a further steep fall being recorded over the war years (see table 3). Henceforth, English cheese-making would remain firmly established in the industrial creameries, which continued to produce the designated varieties in high volumes.

Table 3 here

These dramatic shifts in production were partnered with equally turbulent developments in consumer markets and supply chains. Government intervention played a crucial role in the former through the imposition of food rationing in the 1940s and 1950s. Rationing encouraged industrial-scale production of a narrow set of varieties because it required that retailers could readily divide cheese into small, standard-sized portions. Looser-textured cheeses, such as Cheshire, were reformulated to meet these requirements and the traditional coloring of particular varieties was discontinued. Production practices migrated toward the already-dominant Cheddar system, which was perceived as optimizing the state-imposed requirements for ease of cutting, nutritional value, and storage capability. The effect on consumer purchasing behavior was to reinforce a pre-existing preference for Cheddar and the other designated varieties, delivered in standardized portions. Despite some evidence of public dissatisfaction with the wartime cheese ration, reflected in the derogatory term, “mouse trap cheese,” there were few signs of local pressure to retain traditional varieties. For the most part, consumers accepted the standardized products of English creameries, just as they had taken to the factory cheese imported during the preceding half century.



### *Summary and International Comparison*

The industrial model was finally established during an extraordinary episode of government intervention, under the auspices of the Ministry of Food. Events in the war years were driven by short-term food security imperatives, rather than by broader concerns regarding international competitiveness. However, they cut across a more extended period in which the sector was subjected to contrasting sets of policies that sought to make domestic products more competitive in relation to industrialized international rivals, while also offering some residual protection to farmhouse producers. The gradual rise to supremacy of the supermarkets from the 1960s onwards would serve to reinforce the position of industrial-scale cheese-makers, while the remaining farmhouse makers gained some support from the fixed price regime. The multiple retailers favored industrial cheese because it was easier to deal with a small number of large suppliers under a national network system; the introduction of the pre-packed block format also suited the self-service format of the large retail store. Imported industrial cheese also recovered some of its pre-war position in the market, so that a typical store in the 1970s would display Canadian cheddar and a limited array of continental specialities alongside domestically produced cheese. In terms of artisan production, whilst it may be argued that the regulatory regime provided a degree of security to remaining artisan producers, through the MMB's pricing and purchasing system, it also removed any incentive for product differentiation or innovation on the part of smaller producers.<sup>83</sup>

In the immediate postwar period, dairy farming in the Netherlands remained relatively small-scale, and largely organized in a co-operative structure. Mechanization and modernization then became the main focus. Increased use of the tanker system for farm milk collection was instrumental in this process, leading to the development of industrial-scale milk processing and a corresponding decline in small-scale on-farm cheese-making. Farmhouse Edam production had ceased by the mid-1970s, and there was a substantial loss of cheese farms in South Holland and Utrecht.<sup>84</sup> France provides the most intriguing contrast to the English situation in this period. French food policies had evolved very differently to those in England, in favoring the protection and support of artisan food production. Thus whilst England pursued the centralization of milk processing and specification of a handful of official cheese varieties, France created, in 1935, the *Institut National des Appellations d'Origine* (INAO), a statutory body responsible for implementing AOC laws initially for wines, latterly extended to dairy products and other agrifoods. This body raised the profile of differentiated, special quality products and supported their protection. This protection remained a significant part of French food policy throughout the mid to late twentieth century, driven by the twin objectives of improving the country's competitive position in international markets, and supporting agricultural producers in marginal rural areas.<sup>85</sup> However, following the disruptions and deprivations of the Second World War, the French government also began to promote technological improvements and industrialization in the agricultural and food sectors, which led to a crisis period for artisan cheese-makers in the 1950s.<sup>86</sup> At this time, many of the French artisanal cheese-makers themselves adopted more industrialized methods, whereas others steadfastly refused to change and suffered decline as a result. In Normandy for example, efforts to revive farm-based production of

Neufchatel after the Second World War were short-lived, with production declining by the 1960s, and continuing to dwindle to a handful of producers by 2000.<sup>87</sup> In the case of Camembert, the refusal of the Normandy-based factories to grow beyond a certain size meant that larger scale industrial producers in the eastern regions stepped in and increased their market share.<sup>88</sup> This period also saw a number of the farmer cooperatives producing the most renowned French cheeses being acquired by large dairy conglomerates.

### Conclusion

This historical narrative has investigated the “recombinability and interpenetration” of artisanal and industrial modes of production in a relatively unexplored sector.<sup>89</sup> We have seen how English cheese-makers pursued a far from straightforward path to industrialization, one that was deeply rooted in the earlier commercialization of the country’s principal regional cheese varieties, and in the broader dynamics of its colonial heritage. By the mid nineteenth century, England was equipped with relatively advanced national distribution systems, well-resourced and experienced intermediaries, supportive regulatory regimes, and expanding urban markets. In all these respects, the country was primed for the rapid development of industrial-scale production. However, despite making considerable progress in standardizing commercial production practices, English cheese-makers did not achieve a rapid transition from farm to factory. Instead, it was left to cheese-makers in the United States to grasp the productive opportunity posed by the English cheese market. Within a few years, their nascent “cheese factories” were transformed into export-led industrial plants, capable of manufacturing large quantities of England’s leading regional varieties. English efforts at industrialization faltered, while much of the country’s farm-based production declined as further waves of factory-building in countries such as New Zealand led to intensified international competition. By the early twentieth century, English consumers had become largely accustomed to the imported, factory-produced cheeses that dominated the home market; the remaining English cheese was still mostly made on the farm, but much of it was regarded as inferior to the factory product. The eventual stimulus for the industrialization of English cheese-making was state intervention rather than the operation of the market, as the government first sought to stabilize the dairy sector in the 1930s, and subsequently to mobilize it during the Second World War. The industrialized mode of production remained dominant, as the wartime imperatives of efficiency and control gave way to the postwar growth in multiple food retailing. Despite a more recent resurgence, which coincided with de-regulation of the milk market, artisanal techniques of cheese-making have only survived in a modified form, oriented toward the requirements of premium markets.<sup>90</sup> The voice of elite consumers has been heard periodically, both in the form of gastronomic critique and in more substantive efforts to re-assert artisanal practices and traditional varieties. However, this has been outweighed by mass-consumer preferences, which have tended to favor lower prices and the greater consistency achieved through industrial production. These preferences have been articulated throughout the narrative by another potent set of actors, the retail intermediaries. From the mid-seventeenth century, London cheesemongers and their networks of cheese factors contributed to a re-shaping of domestic production practices and the creation of new patterns of regional

specialization. In the mid-nineteenth century, their successors extended the scope of this intermediary role, thereby encouraging the growth of industrial-scale production on an international stage.

In what ways has England's experience been distinctive, compared with countries such as the Netherlands and France? Dutch cheese-making experienced a similar pattern of early commercialization, though this was accompanied by a more substantial and specialized export trade than that seen in England. As a result of this commercial development the Dutch also established a combination of advanced supply chains and production technologies that appeared to be conducive to full-scale industrialization. However, in contrast to their English counterparts, the Dutch were successful in developing cheese factories during the second half of the nineteenth century, specifically to supply their major export markets. By the mid-twentieth century, there was more commonality between the English and Dutch situations: large-scale industrial production was accompanied by a rather modest growth in small-scale, artisanal cheese-making, the latter being encouraged by changes in agricultural support policies and market revalorization trends. French cheese-making provides a sharper contrast with that of England, in which a much more fragmented pattern of localized production, distribution, and consumption persisted into the nineteenth century. However, French factory systems were introduced in the late nineteenth century, as some of more prominent dairying regions began to exploit their improved transport links to the Parisian market; this process was exemplified by the emergence of Camembert as a "national" cheese variety in this period. During the twentieth century, the most marked contrast between English and French experiences has been in the relation to national food policies. From the 1930s, the primary emphasis of English policy shifted towards standardization and mechanization, and by mid-century production was concentrated into a small number of large, state-controlled creameries. French policy in the twentieth century was more strongly oriented towards the support and protection of territorial production systems, based on traditional artisan activity, co-operatively organized. The cheeses arising from such systems have maintained a significant domestic market share in France today, compared with the tiny share of artisanal cheeses in England. However, agricultural modernization policies of the 1950s also contributed to a decline in France's artisanal producers, and to adaptations by the survivors; as contemporary critiques have highlighted, many of the AOC production systems now involve industrial logics of production and governance. Thus, it may be argued that such systems no more represent a "pure" form artisanship than those associated with small-scale revivalist cheese-makers in England or the Netherlands. More broadly, we can conclude that each of these instances of artisanal production is better understood as the outcome of an extended period of interaction between competing economic orientations, played out in their distinctive national contexts.

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## Figures and Tables

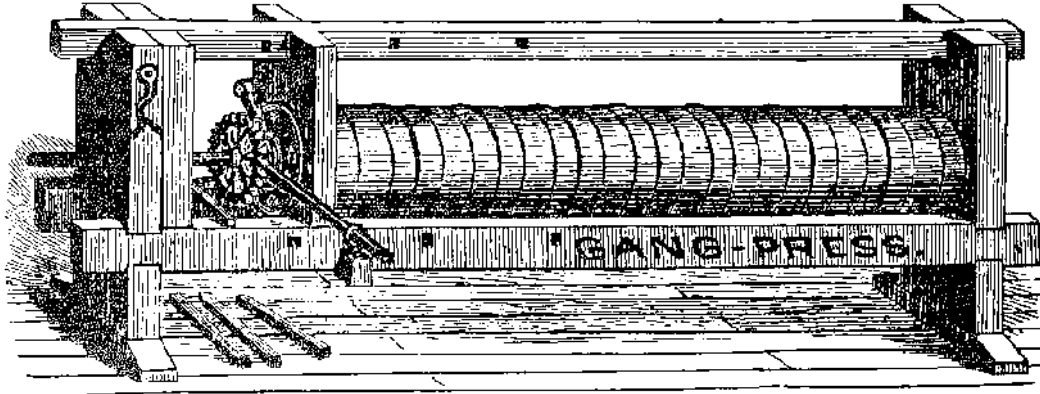


Figure 1 Technological innovation in the cheese factory. The gang-press was one of several innovations in this period that enabled factories to process increasing volumes of cheese. Source: X.A. Willard, *Practical Dairy Husbandry* (New York, 1877), 369.

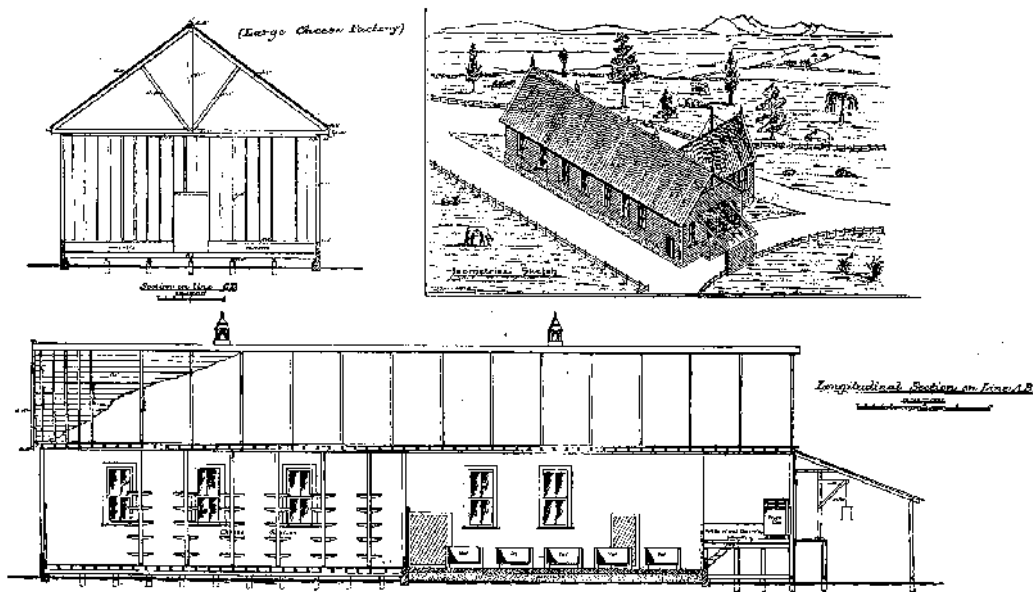


Figure 2 Design for a 'large' New Zealand cheese factory. Covered delivery points, multiple cheese vats, separate boiler houses and adjacent curing houses for maturing cheese, were also typical design features of early American factories (cf. Willard, *Practical Dairy Husbandry*, 369). Source: Kinsella, J.A. *Dairying Service Report, 1900-1901*, 6 (Wellington, 1901).

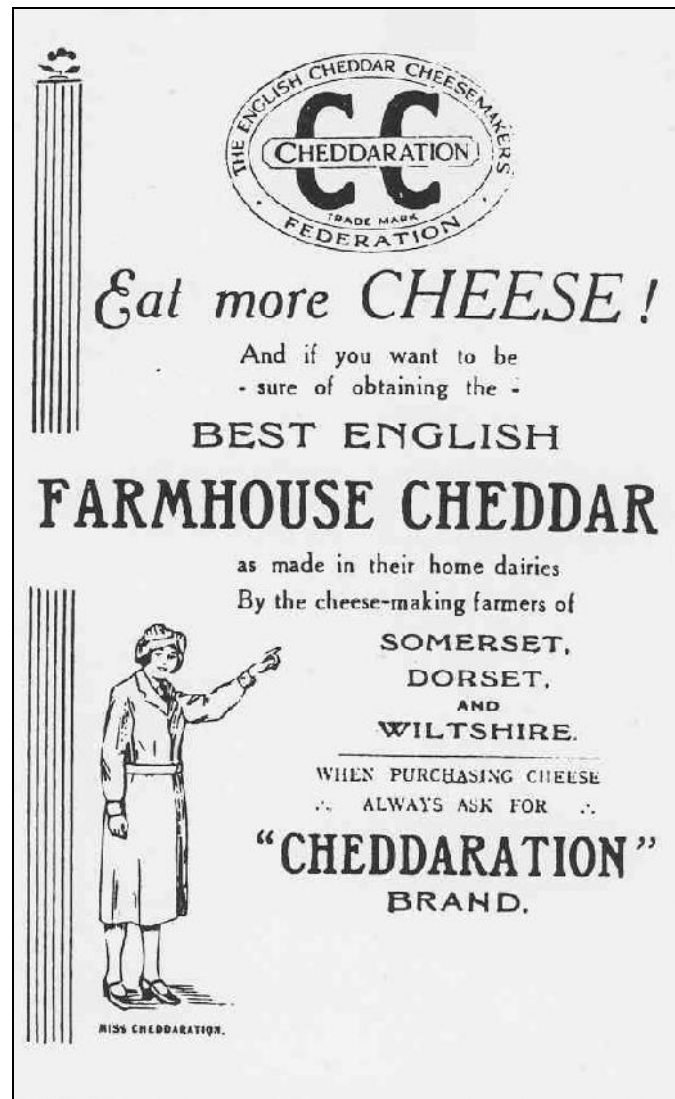


Figure 3 The Cheddar Cheese Federation initiated promotional campaigns, such as 'Miss Cheddaration' (1928), and voluntary grading schemes in an effort to improve the reputation of English farmhouse cheese. Source: Wilson, A. *Forgotten Harvest: the Story of Wiltshire Cheese-Making* (Calne, 1995), 188.

Table 1 Cheese Imported into the United Kingdom, 1874

Country of Origin	Quantity (tons)	Share by Volume (%)
United States	49,296	57.2
The Netherlands	23,136	26.9
Canada	12,820	14.9
France	318	0.4
Germany	254	0.3
Sweden	182	0.2
Other	139	0.2
Total	86,145	

Source: Morgan Evans, "Butter and Cheese," in *British Manufacturing Industries*, ed. G. Phillips Evans (London, 1878), 156.

Table 2 Cheese Imported into the United Kingdom, 1928

Country of Origin	Quantity (tons)	Share by Volume (%)
New Zealand	90,221	51.7
Canada	53,355	30.6
The Netherlands	13,253	7.6
Italy	8,210	4.7
Australia	4,279	2.5
United States	325	0.2
Other	4,725	2.7

Source: Official returns of Imports of Butter and Cheese in 1928, reported in C. W. Tidsdale and J. Jones, *Butter and Cheese* (London, 1929), 2.

Table 3 Farmhouse Cheese-Makers in English Regions, 1939 and 1948

Year	Cheshire	Lancashire	South West (Including Cheddar)	Wensleydale
1939	405	202	514	176
1948	44	29	61	9

Source: Patrick Rance, *The Great British Cheese Book* (London, 1982), 133—tabulated. Prewar figures are based on the Milk Marketing Board (MMB)/Ministry of Agriculture Register of Cheese-Makers for 1939; postwar figures are based on an unpublished farm survey, conducted by MMB and Ministry of Agriculture officials and obtained by the author.

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  2. Charles F. Sabel and Jonathan Zeitlin, *World of Possibilities: Flexibility and Mass Production in Western Industrialization* (Cambridge, U.K. 1997), 2-3, 9-20; Peter Hull Kristensen and Charles F. Sabel, "The Small-holder Economy in Denmark: The Exception as Variation," in *World of Possibilities*, eds. Sabel and Zeitlin, 344-78.
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  6. See Stephen Mennell, *All Manners of Food: Eating and Taste in England and France from the Middle Ages to the Present* (Oxford, U.K., 1985).
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9. See P. Brassley, "Northumberland and Durham" and B.A. Holderness, "East Anglia and the Fens," in *The Agrarian History of England and Wales*, ed. Thirsk, 30-31, 231-32.

10. See David Hey, "The North-West Midlands: Derbyshire, Staffordshire, Cheshire and Shropshire," in *The Agrarian History of England and Wales*, ed. Thirsk, 149-58; P.R. Edwards, "The Development of Dairy Farming on the North Shropshire Plain in the Seventeenth Century," *Midland History* 4, nos. 3 and 4 (1978): 175-90.

11. Port Books for the years 1685-1689 indicate that the greatest of these, John Ewer, was responsible for more than 41 percent of cheese shipped over this period. Charles F. Foster, *Cheshire Cheese and Farming in the North West in the 17<sup>th</sup> and 18<sup>th</sup> Centuries* (Northwich, U.K., 1998), 19.

12. Ibid., 31-32.

13. See, for example, William Cobbett, *Rural Rides*, (1830; Harmondsworth, U.K., 1973), 362-63.

14. Holderness, "East Anglia and the Fens," 231-32.

15. For evidence of similar trade-offs between cheese- and butter-making, see Giles V. Harrison, "The South West: Somerset, Devon and Cornwall," in *The Agrarian History of England and Wales*, ed. Thirsk, 280.

16. R.C. Latham and W. Matthews, eds., *The Diary of Samuel Pepys, Volume II*, (London, 2000), 191 (diary entry, 4 Oct. 1661).

17. *Journal of the House of Commons, Volume 10: 1688-1693* (London, 1802), 475-76. See also, Joan Thirsk, *Agricultural Change: Policy and Practice—Chapters From the Agrarian History of England and Wales, Volume 3* (Cambridge, U.K., 1990), 189.

18. Foster, *Cheshire Cheese and Farming*, 22. Maitland obtained his London freight figures directly from a port official, John Newman; the categorizations are somewhat ambiguous, but cheese identified as "Cheshire" represents 55 percent of the total tonnage recorded.

19. Foster, *Cheshire Cheese and Farming*, 10; Thirsk, "Regional Farming Systems," 153-54.

20. Evidence from farm inventories and Port Books confirms that cheeses grew steadily in size from the late 1680s, averaging 20-24lb (9-11kg) by the end of the century. Foster, *Cheshire Cheese and Farming*, 13, 22.

21. Christopher Morris, ed., *The Journeys of Celia Fiennes* (London, 1947), 177

22. For example, in 1825, the inhabitants of Chester presented the Duke of York with a 149lb (68kg) cheese, described at the time as the largest ever made. The practice was later reproduced in North America, with cheese-makers in Cheshire County, Massachusetts pooling their milk to make a huge inaugural cheese for Thomas Jefferson. Foster, *Cheshire Cheese and Farming*, 13-24. McMurry, *Transforming Rural Life*, 126.

23. Foster, *Cheshire Cheese and Farming*, 13-17, 25-30; Thirsk, *Agrarian History*, 362-63.

24. Harrison, "The South West," 379.

25. Edwards, "Development of Dairy Farming," 175-90.
26. The mythical character of the Stilton narrative is echoed by those surrounding other famous cheeses, such as Camembert. Similar debates revolve around their antecedents and the significance of particular individuals in their subsequent success. See Boisard, *Camembert*, 1-25; G.E. Mingay, "The East Midlands," in *The Agrarian History of England and Wales*, ed. Thirsk, 99.
27. See Angela Tregear, "From Stilton to Vimto: Using Food History to Rethink Typical Products in Rural Development," *Sociologia Ruralis* 43, no. 2 (2003): 99-100.
28. Josiah Twamley et al., *Essays on the Management of the Dairy; Including the Modern Practice of the Best Districts in the Manufacture of Cheese and Butter. Deduced from a Series of Observations Made During Thirty Years' Practice* (London, 1816).
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30. Christine Hallas, *Rural Responses to Industrialization: The North Yorkshire Pennines, 1790-1914* (Bern, Switzerland 1999), 112-14; W.B. Crump, *The Little Hill Farm* (Halifax, U.K., 1938), 127.
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32. Twamley, *Essays*, 166.
33. See H. Clout, "The Pays de Bray: A Vale of Dairies in Northern France," *Agricultural History Review* 51, no. 2 (2003): 190-208; Gérard Béaur, *Histoire Agraire*

*de la France au XVIIIe Siècle: Interties et Changements dans Francaises entre 1715 et 1815* (Paris, 2000), 211-12; Dick Whittaker and Jack Goody, "Rural Manufacturing in the Rouergue from Antiquity to Present: The Examples of Pottery and Cheese," *Comparative Studies in Society and History* 43, no. 2 (2001): 225-45.

34. Val Cheke, *The Story of Cheese-Making in Britain* (London, 1959), 175-81.

35. McMurry, *Transforming Rural Life*, 3, 129.

36. Ibid., 129.

37. Ibid., 129, 133.

38. It was known that cheese consumption far exceeded domestic production.

While no reliable figures were available, "some authorities estimate that fully one-half the cheese sold is derived from abroad." Morgan Evans, "Butter and Cheese," in *British Manufacturing Industries*, ed. G. Phillips Evans (London, 1878), 155-56.

39. X.A., Willard, *Willard's Practical Dairy Husbandry* (New York, 1877), 257-58.

40. Ibid, 271.

41. Ibid., 274-75; McMurry, *Transforming Rural Life*, 135, n40.

42. See, for example, Lucius L. Van Slyke and Charles A. Publow, *The Science and Practice of Cheese-Making* (New York, 1909).

43. David Taylor, "Growth and Structural Change in the English Dairy Industry, c1860-1930," *Agricultural History Review* 35, no. 1 (1987), 52.

44. Ibid., 50-51; Cheke, *Story of Cheese-Making*, 185.

45. *Agricultural Gazette* 29 (1889), 38, cited in Taylor, "Growth and Structural



Change,” 51.

46. Avice R. Wilson, *Forgotten Harvest: The Story of Wiltshire Cheese-Making* (Calne, U.K. 1995), 168-71.

47. Taylor, “Growth and Structural Change,” 51; Wilson, *Forgotten Harvest*, 168.

48. Scola, *Feeding the Victorian City*, 76.

40. Taylor, “Growth and Structural Change,” 54-55; Hallas, *Rural Responses*, 129-36.

50. Hallas, *Rural Responses*, 131; G.C. Baugh (ed.) *A History of Shropshire, Volume 4, Agriculture (Victoria County History)*. (Woodbridge, U.K., 1989), 232-69.

51. Cormac Ó Gráda, “British Agriculture 1860-1914,” in *The Economic History of Britain Since 1700, Volume 2, 1860-1939*. eds. Roderick Floud and Deidre McCloskey (Cambridge, U.K., 1994), 145-172.

52. Wilson, *Forgotten Harvest*, 161-63.

53. Hallas, *Rural Responses*, 129-30, 146. For examples of similar responses in Cheshire, see Taylor, “Growth and Structural Change,” 59.

54. Taylor, “Growth and Structural Change,” 52. For later expressions of this view, see James Long, *Reports on the Relation of Dairy Produce of New Zealand to the English Market Together with Practical Hints on Cheese-Making* (Wellington, New Zealand, 1889), 52.

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56. Ernest Mathews, "Preface," in Leonard J. Lord, *Practical Butter and Cheese Making* (London, 1925), 5.
57. Wilson, *Forgotten Harvest*, 183-184.
58. Long, *Reports on the Relation...*, 99.
59. Extracts of quotations from London cheese factors, Wheeler, Bennett & Co, and Reynolds, Sons & Co. Cited in Long, *Reports on the Relation ...*, 65-68.
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61. Ibid., 5.
62. Ibid., 50, 52.
63. John Sawers, *The Dairy Industry of New Zealand: A Report on the Result of the Season's Work* (Wellington, New Zealand, 1893), 6-7, 17.
64. J.A. Kinsella, *Dairying Service Report, 1900-1901* (Wellington, New Zealand, 1901); C.W. Tisdale and J. Jones, *Butter and Cheese* (London, 1929), 2.
65. Sir John Squire, ed., *Cheddar Gorge: A Book of English Cheese* (London, 1937), 14.
66. Taylor, "Growth and Structural Change," 49; Edith H. Whetham, *The Agrarian History of England and Wales, Vol. VIII, 1914-39* (Cambridge, U.K., 1978), 145-48.
67. Squire, *Cheddar Gorge*, 16. See also André Simon, *A Catechism Concerning Cheese* (London, 1936); George Orwell, *The Road to Wigan Pier* (London, 1937), 89.
68. William, H. Beveridge, *British Food Control* (London, 1928), Table XX; His Majesty's Stationery Office, *The Report on the Census of Production for the United*

*Kingdom, 1924* (London, 1931), 106-07.

69. His Majesty's Stationery Office, *The Report on the Census of Production for the United Kingdom, 1924*, 106-07.

70. Taylor, "Growth and Structural Change," 55.

71. See Richard K. Blundel, "Network Evolution and the Growth of Artisanal Firms: A Tale of Two Regional Cheesemakers—1950-2000," *Entrepreneurship and Regional Development* 14, no. 1 (2002), 19-21.

72. For a discussion of agricultural developments in the Netherlands, see A. Milward and S. Saul, *Development of the Economies of Continental Europe 1850-1914* (Cambridge, Mass, 1977), 142-214.

73. Boisard, *Camembert*.

74. For a discussion of the evolution of AOC laws and food quality conventions in France, see Edzio Valcescini, "Entreprises et Pouvoirs Publics Face a la Qualité: Les Produits Agro-Alimentaires Dans le Marché Européen," Marie-Thérèse Letablier and Claire Delfosse, "Genèse d'Une Convention de Qualité: Cas des Appellations d'Origine Fromageres, " and B. Sylvander, "Conventions de qualite, concurrence et cooperation: cas du Label Rouge dans la filiere volailles," all in

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respectively.

75. Beveridge, *British Food Control*, Appendix H, 416-417. The control regime introduced during the First World War had included a compulsory cheese grading scheme.

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77. T. Rooth, "Trade Agreements and the Evolution of British Agricultural Policy in the 1930s," *Agricultural History Review* 33, no. 2 (1985): 173-90.

78. Separate milk marketing boards were established in Scotland. See Smith, *Cheese-Making in Scotland*.

79. R.J. Hammond, *Food and Agriculture in Britain, 1939-45: Aspects of Wartime Control* (Stanford, Calif., 1954), 100-02; E.T. Denhardt, *Food Control in Great Britain* (Montreal, 1942), 86-89.

80. Wilson, *Forgotten Harvest*, 189.

81. Ministry of Agriculture, Fisheries and Food, *Cheesemaking: Bulletin No. 43, 4<sup>th</sup> Edition* (London, 1959).

82. *Ibid.*, 8.

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84. Adri de la Bruheze and Anneke van Otterloo, "The Milky Way: Infrastructures and the Shaping of Milk Chains," *History and Technology* 20, no. 3 (2004): 249-69; N. Eekhof-Stork, *The World Atlas of Cheese* (London, 1976). For

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86. Boisard, *Camembert*, 160-65.

87. Clout “The Pays de Bray,” 190-208.

88. Boisard, *Camembert*, 160-65.

89. Sabel and Zeitlin, *World of Possibilities*, 2. On neglected small firm histories, see also, Carnevali, “Golden Opportunities,” 272-98.

90. See, for example, Patrick Rance, *The Great British Cheese Book* (London, 1982); British Cheese Awards, *Statistics: 1994-2004* (Churchill, Oxfordshire, U.K., 2004); Juliet Harbutt, *The Specialist Cheesemakers Association Guide to the Finest Cheese of Britain* (London, 2001).